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IDENTITY CARD WITH OPTICAL DATA STORAGE

The invention relates to an ID card which preferably meets ISO standards 7810 and 7816, wherein a microprocessor chip, including its contacts, is arranged in the center relative to reference edges, and on which an optical data carrier is arranged.

It is known how to apply an optical data carrier to an ID card in the form of a laser inscripted strip, which has only a limited capacity for signs.

It is also known how to apply to an ID card a microprocessor chip in which programs and data are stored, processed, read, written and modified in accordance with ISO standards 7810 and ISO 7816. The data can be exchanged with an external device.

It is also known to write data in spiral form on disk-shaped data carrier by means of laser writing devices and to read with suitable laser devices. This spiral data recording results in significantly higher storage density than the known linear recordings on ID cards. The spiral recording of digital data is used especially for recording music, i.e., a mass market, so that relatively inexpensive reading and inscription devices are available. To accomplish this, devices are known which guide the leaser spirally to write and read the stationary data carrier.

It is the object of the present invention to provide an ID card which has a large optical storage capacity and which can be processed with cost-effective devices.

The solution to the problem under consideration is that, on the ID card, at least one optical data storage region is arranged spirally in accordance with a CD standard on the outside of the microprocessor chip. The center of the spiral is preferably arranged approximately in the middle in a free space in the data storage region between the microprocessor chip and the three adjacent edges of the ID card.

Advantageous embodiments are defined in the dependent claims.

Optical data storage regions may be provided on one or both sides. The two arrangements preferably complement each other in such a way that

when the cord is turned over it can be processed with the same laser device. In a symmetrical arrangement of the center the two double-sided storage regions are thus arranged concentrically.

The relatively large storage capacity of the optical data carrier allows for large amounts of data, more particularly, personal data such as calendar dates, for example, relating to a disease history, treatment, billing to be stored, i.e., the ID card can be used for novel applications.

The novel ID card is advantageously equipped for novel applications involving security coding and decoding means in such a way that the personal data can only be input an/or read and/or changed by authorized persons, more particularly, the owner of the card.

The security means are advantageously housed in the microprocessor chip on the same ID card so that encryption and decoding occur there, and only encrypted data are exchanged between the microprocessor and the external optical reader and writer station. Decoded data are only handled externally upon input by the authorized person together with the ID number, which, during the initialization, was transmitted to the processor, and only during a query by the authorized person and upon disclosure of the ID code.

It is advantageously provided that the ID code is coded during the initialization of the microprocessor chip and is processed in such a way that

unauthorized reading of the ID code is practically impossible. During the verification of the ID code, the input ID code is encrypted as during the initialization, and a comparison with the stored encrypted ID code is made, whereupon further program commands for reading, processing or for outputting decoded optically stored data are only executed if the ID code is determined.

Further advantageous embodiments are illustrated in Figs. 1 to 3 of which:

Fig. 1 is a top view of the ID card;

Fig. 2 is a view of the arrangement underneath an ID card;

Fig. 3 is a schematic view of the operating system.

Fig. 1 illustrates and ID card (1) including a microprocessor chip (2) whose contacts (K) are arranged in standard configuration relative to the reference edges (BK1, BK2) of the ID card (1). An optical data carrier (3) is arranged on the larger card region next to the microprocessor chip (2) and approximately concentrically to this region; this data carrier is in the form of a spiral path and has a CD format. In order to obtain a storage capacity that is as large as possible, the center (Z) is approximately in the center in the free region of the card, and the edge of the recording spiral extends into the

proximity of the card edges. The diameter (D) of the optical storage region (3) is slightly smaller than the width of the card (B), for example, 45 mm, so that approximately 4 mm free space remains between the three adjacent card edges and the adjacent circuit contacts (K) as space to be used for the arrangement of the reading device and guide elements for the same when the card is placed in a reading and or writing device.

Fig. 2 is a view of the underside of the card (1) on which an optical data storage region (3A) is arranged with its center (ZA) coaxial to the optical data storage region on the other side of the card.

Fig. 3 is a view of a block diagram of a card reading device connected to the microprocessor (2) and an optical data storage device (3, 3A). The card reading device comprises, for example, an external computer processor (EP), including an input device (E) and an output device (A). The actual reading device (LG) comprises a contact arrangement (KA), which establishes a connection via contacts (K) of the microprocessor chip (2) to the power supply and the data connections. The reading device also comprises a laser reading device and, if indicated, a writing device (LA), which guides the laser beam in a known manner on the spiral data recording path and records the data, in this case, through responding pulses or, if the laser power is low, reads the same, as determined by the external processor.

These types of laser devices for a CD disk wherein the data carrier is stationary and the laser beam is guided or the laser itself is guided on a spiral path, are known in the entertainment electronics industry and can be easily used for data recording and reading.

In order to read the data on the optical data carrier by unauthorized persons, it is proposed to equip the microprocessor chip (2) with a storage region for the purpose of storing programs (P1, P2), especially, encryption code (ISD1, SD2). The first program (P1) is an initialization program (P1) which also serves for storage and, at the same time, for a subsequent verification of the user identity code (ISDA1). This ID code is stored in the associated storage region (ISDA1) and is preferably not readable. Furthermore, a code key (SDA2) is stored in an associated storage region during the initializations process; in which case, the program ensures that this encryption code (SD2) cannot be read again by the external processor (EP). Furthermore, the encryption program (P2) is stored in the microprocessor (2) during the initialization process, and this program cannot be read by the external processor (EP).

In order to input or read data in the optical data storage device (3), the respective user must identify himself to the microprocessor (2) with his ID code (ISD1) via input device (E) through the external processor (EP),

whereupon the input ID code is checked by means of the program (P1). If the ID is identical to a stored ID (ISD1), the data to be stored is converted by means of the ID coding program (P2) in accordance with the encryption code (SD2) and returned in a coded form to the external processor (EP); from there the encrypted data is fed to the laser device (LA), and is then recorded in the optical data storage device (3, 3A).

In order for data to be read by the authorized user, the ID code (ISD1) of the person is first checked by means of the program (P1) and, if the identity is identical, a re-conversion of the read data is undertaken by means of the decoding program (P2). In this case, provision may be made for a portion of the information to be further processed in a decoded form in the microprocessor (2), and only predetermined coded data is returned to the external processor and returned from there to the output device (A).

Since the storage capacity of the optical data storage device (3) is relatively large compared to conventional data storage devices such as ID and credit cards, different data regions associated with different address regions may be configured there. The administration of these types of regions, which serve different functions, is expediently accomplished by the microprocessors (2) and, if desired, a plurality of authorization codes and further encrypted codes may be used. This ensures that different institutions

can address different data regions without allowing unauthorized access to other regions.

CLAIMS

1. An ID card, preferably meeting ISO standards 7810 and 7816, wherein a microprocessor chip (2), including its contacts (K), is arranged in the center relative to reference edges (BK1, BK2), and on which an optical data carrier is arranged, characterized in that on the ID card (1) at least one optical data storage region (3, 3A) is arranged spirally on the outside of the microprocessor chip (2).

2. An ID card as defined in Claim 2 [sic], characterized in that the center of the spiral (Z) in the data storage region (3) is preferably arranged approximately in the middle in a free space between the microprocessor chip and the three adjacent edges of the ID card.

3. An ID card as defined in Claim 1 or 2, characterized in that the diameter (D) of the optical storage region (3) is slightly smaller than the width of the card (B).

4. An ID card as defined in one of the preceding claims, characterized in that one of the data storage regions (3A) is arranged on the opposite side from the contacts (K) of the ID card (1).

5. ID card as defined in Claim 4, characterized in that on both sides of the ID card one of the data storage regions (3, 3A) is arranged and they are disposed complementary to the edges of the card and/or concentrically relative to one another.

6. ID card as defined in one of the preceding claims, characterized in that the optical data storage region (3) contains encrypted data, whose encryption code (SD2) and encryption and encoding programs (P2) are stored in the microprocessor chip (2).

7. ID card as defined in Claim 6, characterized in that the encryption and encoding program (P2) is accessible by way of an identification program (P1) which, together with an identification code (ISD1), are stored in the microprocessor chip (2).

8. ID card as defined in Claims 6 or 7, characterized in that the identification program (P1), the identification code (ISD1), the encryption and decoding program (P2), and the encryption code (SD2) are stored in the microprocessor chip (2) in such a way that they cannot be read via the contacts (K).

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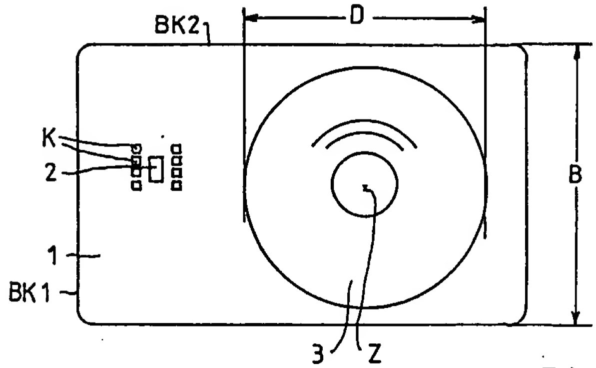

Fig. 1

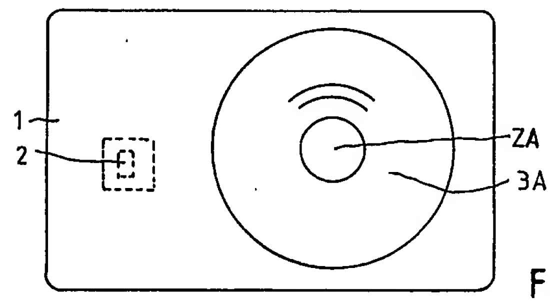

Fig. 2

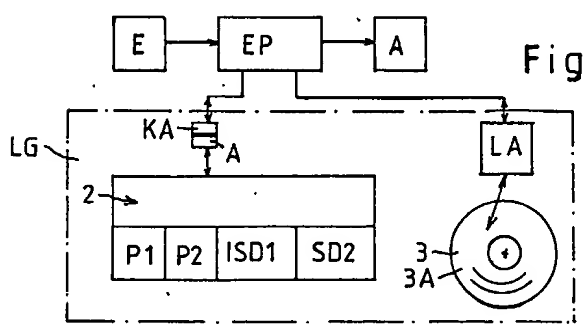

Fig. 3

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